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ABSTRACT

This paper describes a series of four models around which plans can be developed to determine human development needs. It presents needs assessment models describing the process and participant interaction by which information is gathered to be used in education, training, funding, and/or other human resource development interventions to increase the ability of organizations to adequately address work force performance issues. This paper also presents a strategy for determining what skills and knowledge expert workers use when exhibiting "expert work behavior." The job analysis described is a linear systematic process beginning with an understanding of the broadest view of an expert worker's activities and ending with a detailed summary of the specific skills and knowledge needed to carry out each task in the expert's job. It also identifies psychomotor, cognitive, and affective factors associated with the successful job performance. The paper concludes that the job analysis outcome can be used to support a variety of management planning and decision making processes, including organization and job specific training design; education program planning; work force deployment; job design; and development of screening criteria for hiring or career adjustment. (ABL)

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THE EMERGING AND EMPLOYED WORKER: PLANNING FOR THE STRATEGIC IMPERATIVE

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INTRODUCTION

Bennet (1988) suggests that individuals, work groups, and organizations operate in an environment of turbulent change. Burke (1982) describes organizations as open systems whose internal stability can be affected by external forces in the organization's environment. Indeed, it can be postulated that the survival of the organization itself can be threatened if these external forces are not controlled or accommodated. The environmental threats for individuals, work groups, and organizations can take the form of technical, political, economic and/or cultural issues. Knowing how these issues are viewed, and viewing these issues in a knowing way, allows counselors to better prepare their clients for change. Pressures to adopt new ways of working with, or within organizations or occupational areas creates needs for which many emerging workers, existing workers, or special needs workers do not have the skills, knowledge, attitudes, or norms with which to cope (Herr, 1988).

This paper describes models around which plans can be developed for systematically determining the human resource development needs which must be addressed when organizations or formalized groups of workers wish to strategically respond to these issues.

THE PROCESS

The processes by which these analyses are completed are referred to as "needs assessments". Needs assessments in different environments require different strategies. Strategies may call upon a variety of techniques and supporting instruments to gather data and to carry out analyses which ultimately affect plans and implementation activities. As planners, whether we are concerned with the strategic, organizational, economic development, social or political arenas, we invariably face a variety of different issues each time we deal with the planning process.

Several key roles emerge for counselors when planning human resource development (HRD) strategies. These includes helping facilitate the efficient and effective transfer of knowledge and skills from experts to non-experts and the acquisition of desirable work place norms and attitudes. This means the analysis of expert work behavior to determine skill and knowledge issues and development of key insights into the human dimensions of the expert knowledge. These dimensions also include diagnosing for current and planned change in the work place social and cultural environment for which clients must be prepared.

Analyzing a job or occupational area for required knowledge and skill, desired worker characteristics, or organizational culture or other normative issues can be done in a systematic and uncomplicated manner. The remainder of this paper is devoted to describing four needs assessment models and a specific job skill and knowledge analysis strategy.

NEEDS ASSESSMENT DESIGN

In order to effectively design needs assessments it is necessary to understand the interrelatedness of the participants in the process. Research has shown that there are several different models which describe the environment and interactivity of the participants in the needs assessment process. There are four optional models to describe and guide needs assessment design (see attached Figure 1). The choice of model is dependent upon the purpose and the participants. At a very basic level, the researcher or planner may determine that the needs analysis is dealing with a single industry, including many organizations; that it is dealing with many industries in a political/geographic area; that it is dealing with public sector intervention strategies for economic development; or that it is a process that is dealing with a single organization. Within each of these scenarios, the political, social, and economic dynamics affecting the organization and its environment suggest that a unique set of circumstances is

influencing a needs assessment design which is best suited to ferret out the kinds of information sought (Geroy, 1988).

Several recent studies suggest that there are particular activities and types of organizations involved in each model (Geroy & Passmore, 1987; Geroy & Immel, 1987; Geroy, Olson, Ebert, Erwin, Dingle & Eyer, 1987; Geroy, Wright, Poole, Wood, Amick & Collio, 1987). Thus, individual models involve activities which address the unique interplay and relationships of organizational issues; social, economic, and political agendas; and the unique interplay of the different entities within the models (Geroy, 1988, Geroy, 1987).

Needs assessments are carried out in response to several situations involving organizational, group, or individual performance. In the first situation there is a currently perceived performance problem. It is a "now" situation. What is desired now does not exist, and a determination must be made of what solutions can be implemented to resolve the difference.

In the second situation there is a process of planned change about to occur and a determination of what needs to be done to bring about this planned change must be made. This also is a "now" situation but, unlike the first situation, it is not reaction based. Rather, as a needs assessment process, it is proactive in nature.

In the third and final situation, there is a process of change planned as part of a long-term strategy. This is a future situation. The needs assessment process is a proactive one which focuses on future performance needs and the identification of what preparation must be made to insure successful implementation.

In these three situations, a needs assessment may identify a need for some combination of technological change, system or process change, compensation or benefit change, knowledge or skill acquisition or application, or some other type of behavioral change. The causes of the performance problem which are identified as a result of the needs assessment can be classified into four

broad categories: lack of skills and knowledge, environmental, attitude/motivation, and aptitude (Geroy, 1988).

The determination of the difference between "what is" and "what is desired" becomes the key to identifying the content for training and retraining programmes (Kaufman, 1983). Figure 2 (attached) illustrates the single organizational needs assessment effort with which trainers, educators, and planners are most familiar. This kind of needs assessment activity is frequently driven by the strategic plan of a particular organization or enterprise. It is focused internal to an organization, although it may utilize outside resources such as consultants or educational institutions which have the kinds of resources and capabilities necessary to address the issues identified by the organization. These needs analysis activities may address the entire organization, some sub-unit, or another identified group within the enterprise.

Figure 3 (attached) illustrates an across-a-single-industry assessment. This is typically employed for collaborative efforts on the part of several organizations within an industry in order to position the industry, as a whole, in an economically advantageous position in the market place. The organizations may be located together, or they may be spread across a large geo-political arena.

Figure 4 (attached) illustrates an across-multi-industry needs assessment. It is often employed by service organizations such as vocational schools, community colleges, or universities. These entities, restricted by certain geo-political boundaries, serve a variety of organizations and a variety of organizational contacts. While the strategies for these organizations may be economically, socially, or politically driven, needs analysis activity is generally restricted to, and focused on, the institution's service region. The needs assessment model shown in Figure 5 reflects a process instituted by funding or planning agencies concerned with economic growth and development for a variety of political, social,

or economic reasons. Generally, the scenario is one in which the sponsoring agency or organization has a resource, or pool of funds, which is made available, either in whole or on a matching basis, to industries or organizations within a designated area. The goal of the funding agency is to improve individual or organization economics or to serve a social need. The efforts generally focus on training or retraining of work forces in economically depressed areas.

ANALYZING FOR SKILL AND KNOWLEDGE COMPETENCIES

At a micro level, needs assessment can be a process by which we determine required relevant occupational or job skills and knowledge. Historically, the nature of work was such that it was possible for a novice to watch an expert at work, copy the behavior, and produce outcomes of acceptable quantity and quality. This included the adoption of demonstrated job behavior, norms, and values. This process did not require the learner to understand the nature or content of the work or how elements of the work activity interrelated to produce the desired outcome. Likewise, personnel professionals and managers applied observational elements of this method to develop documents describing work behavior which were used as a template to measure qualifications for promotion, for hiring, or for job assignment.

The differences between the nature of work in the past and the nature of work today revolve around two factors: the growing technical complexity of the work and the rapidity of change in technology. Both cause constant psychological adjustment and change in the knowledge and skill requirements of workers. Within this environment, the application of worker skills and knowledge must be managed in an effective and efficient manner.

Performance is key to the success of any organization and understanding what enables desired performance to occur is key to successful management. The key to managing worker performance is understanding what workers do.The key to understanding what workers

do is analyzing their work behavior, the attendant knowledge, skill, and affective dimensions. Likewise, when counselors and potential workers understand the knowledge/skill and affective requirements of a job, there is more success in achieving a match between existing worker skills, planning training to provide workers with needed skills, and selecting workers with desired skills and attributes. Success in these activities contributes to both the development and the implementation of the strategic plans for the organization or for any organizational unit.

The process for determining what workers do (will do) and what skills and knowledge they use (will use) to achieve desired job performance is the job analysis and description process. This process consists of three analysis activities. These include: (1) job description development, (2) task inventory identification, and (3) task analysis.

THE PURPOSE OF JOB ANALYSIS

There are four primary purposes for doing a job analysis. The most common purpose is to provide an information base from which to develop training. Another purpose is to provide information to plan the reassignment of existing workers to best match existing skills with activities requiring specific skills and knowledge. The information gathered about skill and knowledge requirements for jobs also provides a basis for selection and screening of new workers. A final purpose for a job analysis is to aid in job redesign. In one organization, this analysis was critical to developing a strategic plan for merging 36 job classifications into six and shifting the production system from a linear model to a cellular model.

Job analysis helps managers and counselors understand the strengths and weaknesses of a work group. When managers understand where and what kinds of skills and knowledge exist in a group, they are able to match the work group's strengths and weaknesses to the tasks which need to be done. It is common for managers,

supervisors, and peer workers to have a perception of what a person does or what skills he/she possesses which is quite different from those possessed by the worker. This usually occurs as a result of the worker's job changing. This change can occur for a variety of reasons. The most common causes are presented in Figure 6.

new system - same job
new procedure for old system
new responsibilities - same job and system

Figure 6. Causes of Worker Job Changes

Frequently the worker makes adjustments by acquiring new skills and knowledge by trial and error, emulating more experienced workers, and/or applying old skills in new ways. However, this worker response to new job tasks raises issues of efficiency and cost effectiveness. Can an organization afford trial and error, unstructured on-the-job training, or apprenticeship programmes to develop skills needed to achieve desired performance? Until the expert work behavior is analyzed for its skill and knowledge requirements, decisions about training needs or who should perform certain tasks cannot be made effectively and efficiently. Likewise, this information provides insight into the job related behaviors and performance expectations which can be utilized by counselors and educators to better prepare individuals for specific job roles.

JOB ANALYSIS: TOOLS AND TECHNIQUES

Most of labour today is directed at work which involves systems and complex work relationships. The systems and the relationships have one common component - the worker. Workers' performance can be described as resulting from the output of several systems and various relationships in which the workers are involved. Workers relate to their work through three primary

relationships: worker to machine or thing, worker to process, and worker to worker or abstract ideas. The worker to machine relationship can be observed. The worker controls or manipulates the machine, some physical part of the machine, or some physical item. Worker to process relationship may be partially observable and involve the worker in troubleshooting, diagnosing, and making adjustments to systems. Worker to worker relationships are not always observable and are often structured around the interaction and communication of abstract ideas and concepts.

As discussed earlier, effective and efficient education and training, appropriate employee selection, efficient and effective work force deployment, and valid job design are predicated on knowing what an expert does, and not what managers think they do. The approach taken to analyse the job is one which involves systematically moving from the most macro to the most micro view. The goal is to identify the expert's skill and knowledge which is used to successfully complete the job. These analyses activities include: job description development, task inventory identification, and task analysis.

Good job analysis involves three elements. The first is a real setting. The best analyses are conducted on the job site where the expert is working. The second element is the analyst. The analyst must be objective. This requires that he/she set aside any knowledge, experience, or bias that he/she has with the job being analyzed. The third element is the expert. If you want to know what a job entails, how it is carried out, and what kinds of skills and knowledge are required, the key is the person who is considered the expert at that job.

However, before beginning, it is important to say something about experts. Experts may or may not be effective trainers or educators. Experts are good sources for information about a job's skill and knowledge requirement. However, if left to analyse their own job or to develop training, experts may leave out much of the information needed from the analysis. Why? Because they are

experts. Many times experts have so assimilated the skills and knowledge which they draw upon and use that, unless someone without that knowledge causes them consciously to recall and acknowledge it, they will forget they possess or use it. Therefore, it is always good practice to have someone other than the recognized expert do the analysis. Assign to them the role of expert, the source of needed information, and the object of the analysis activity.

JOB DESCRIPTION DEVELOPMENT

The job description is a picture of the total job. Writing a job description is like painting a house. As you paint a picture of the job, use broad general terms -- just as a painter would use a large brush to paint a house.

The job description itself is a brief statement of what the worker does. The scope of the job description should be large enough to include all activities performed by the worker. This is best presented by writing a short paragraph which describes the large clusters of activities rather than listing each individual activity.

TASK INVENTORY IDENTIFICATION

Developing the task inventory is the second phase of information gathering which focuses on identifying what an expert worker does. The outcome of this activity is a list of discrete units of activities which, in total, constitute the job of the expert. The obvious question is "why do we not simply find out how a worker does his/her job, as described in the job description, and what knowledge and skills are required to do it"? Why do we need the task inventory? The answer is that the skills and knowledge required to carry out a job are often complex and not used equally in all parts of the job activity. What is needed is an intermediate organizer of expert work behavior.

The tasks listed on the task inventory serve a variety of management and training purposes. First, they become the organizers around which detailed analyses of skills and knowledge used by the expert worker are carried out.

Additionally, this list serves to support a variety of important management decisions regarding hiring and work force deployment and organization.

TASK ANALYSIS

The most detailed level of job analysis is frequently referred to as task analysis or specific work behavior analysis (Geroy, 1988). This involves the determination of specific knowledge and skills used by the expert to complete each task. The analysis activity focuses upon one task at a time. The types of knowledge and skills can be organized into three general categories. The first category is knowledge about required steps and their sequence to complete each task.

The second category of knowledge is the knowledge a worker needs in order to troubleshoot or problem solve situations and make appropriate adjustments when completing tasks. The greatest likelihood for the need of this type of knowledge is in tasks where a worker is required to interact with some type of system. The types of knowledge within this category are: knowledge about how the system is put together, the systems' parts and their purposes, variables or conditions within the systems which can change or be changed, specifications for these conditions or variables, the controls which change these conditions or variables, the systems' outcomes (resulting problems) if these conditions or variables are allowed to exceed or fall short of the specifications, and specifications as to what to do or how to correct problems in systems.

The third category of knowledge is abstract knowledge which may be technical or general in nature and which is required to understand processes and make decisions necessary to complete tasks

within the job. This type of knowledge is generally used in people-to-people or people-to-idea interactions and processes.

The technical knowledge in this category is considered abstract but specific to a process unique to an operation, activity, or organization. Frequently technical knowledge is focused on a proprietary process or element in an organization. The general knowledge in this category is generalizable and non-proprietary knowledge which a worker (expert) possesses which allows him/her to successfully complete the tasks in his/her job. This knowledge is frequently described in terms of the basic skills (reading, writing, math) and other generalizable subject knowledge such as chemistry, welding, statistical quality control, or blueprint reading. In the case of all analyses, careful attention is paid to determining level of difficulty and complexity of activity or knowledge/skill requirements In addition, care is taken to determine whether the functions completed are the result of psychomotor, cognitive, or affective domains of effort.

SUMMARY

This paper has described a series of models around which plans can be developed which are intended to determine human resource development needs. The needs assessment model(s) presented in this paper describe process and participant interaction by which information is gathered resulting in education, training, funding, and/or other human resource development interventions which are designed to increase the ability of organizations to adequately address work force performance issues. Each model and associated activities can stand alone, or they can be integrated depending on the needs analysis outcome being sought. The models recognize that each set of participant circumstances has a process which insures that the kinds and categories of required knowledge are determined in a systematic manner which reflects the context, the internal and external dynamics, and the environmental influences on the organization.

This paper has also presented a strategy for determining what skills and knowledge expert workers use when exhibiting "expert work behavior". The job analysis described in this paper is a linear systematic process. It begins with an understanding of the broadest view of an expert worker's activities. It ends with a very detailed summary of the specific skills and knowledge needed to carry out each task in the expert's job. It also identifies psychomotor, cognitive, and affective factors associated with the successful job performance.

The job analysis outcome can be used to support a variety of management planning and decision making processes which include: organization and job specific training design, education programme planning, work force deployment, job design, and development of screening criteria for hiring or career adjustment.

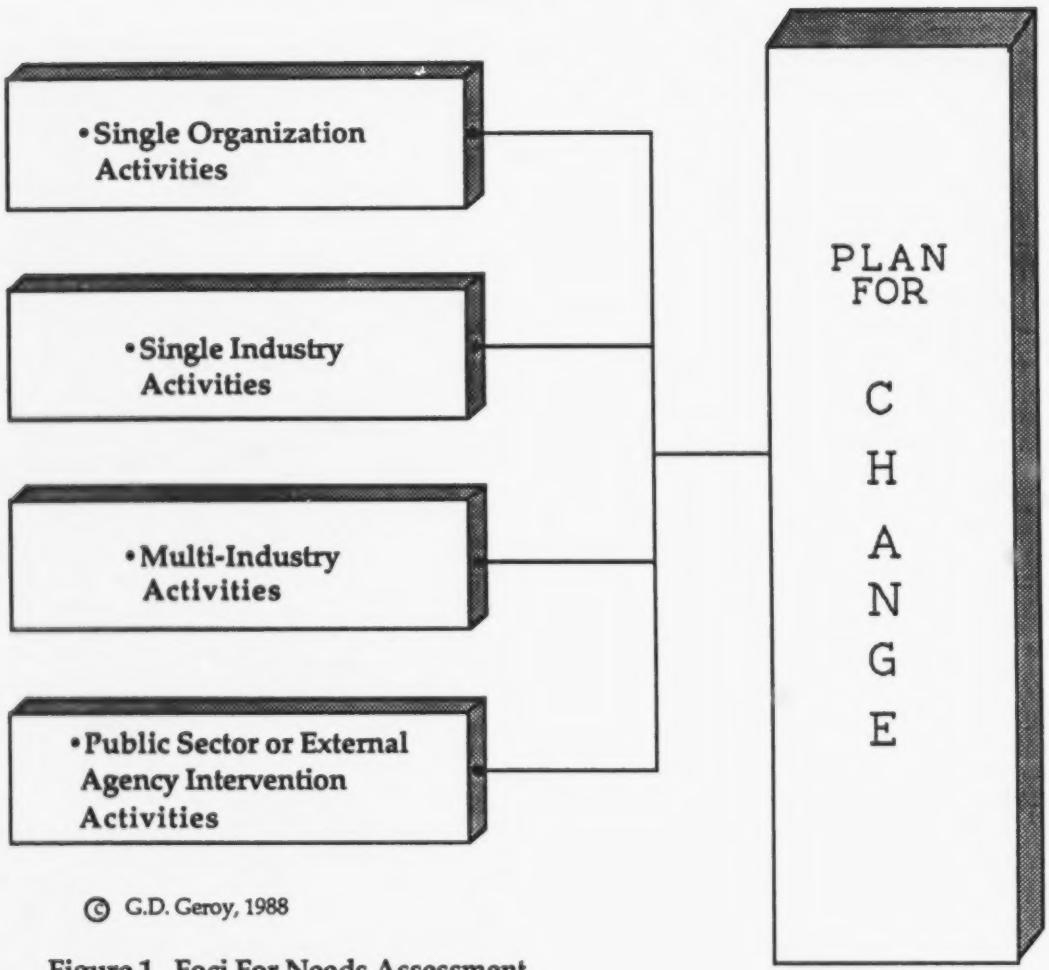

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Figure 1. Foci For Needs Assessment

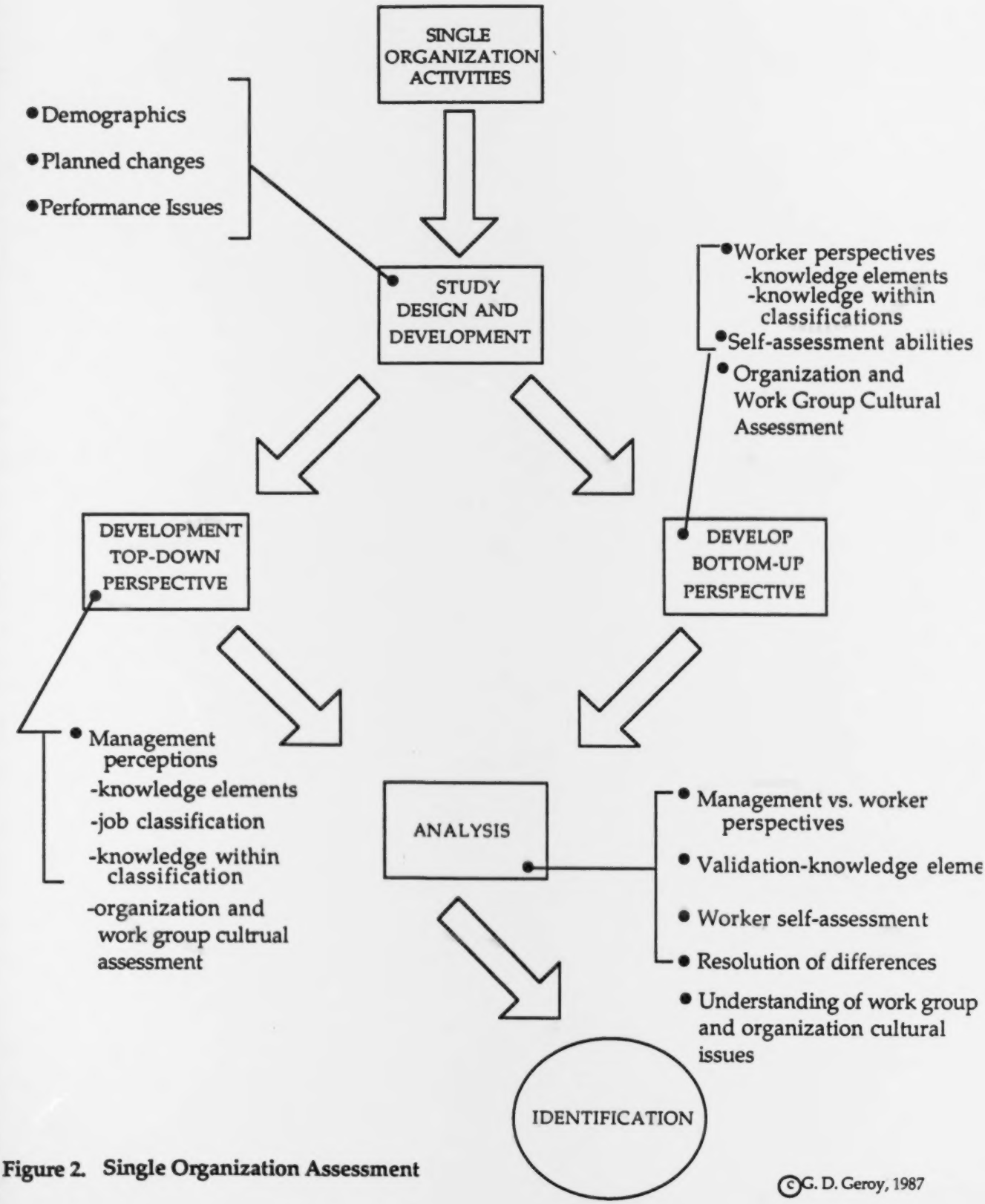

Figure 2. Single Organization Assessment

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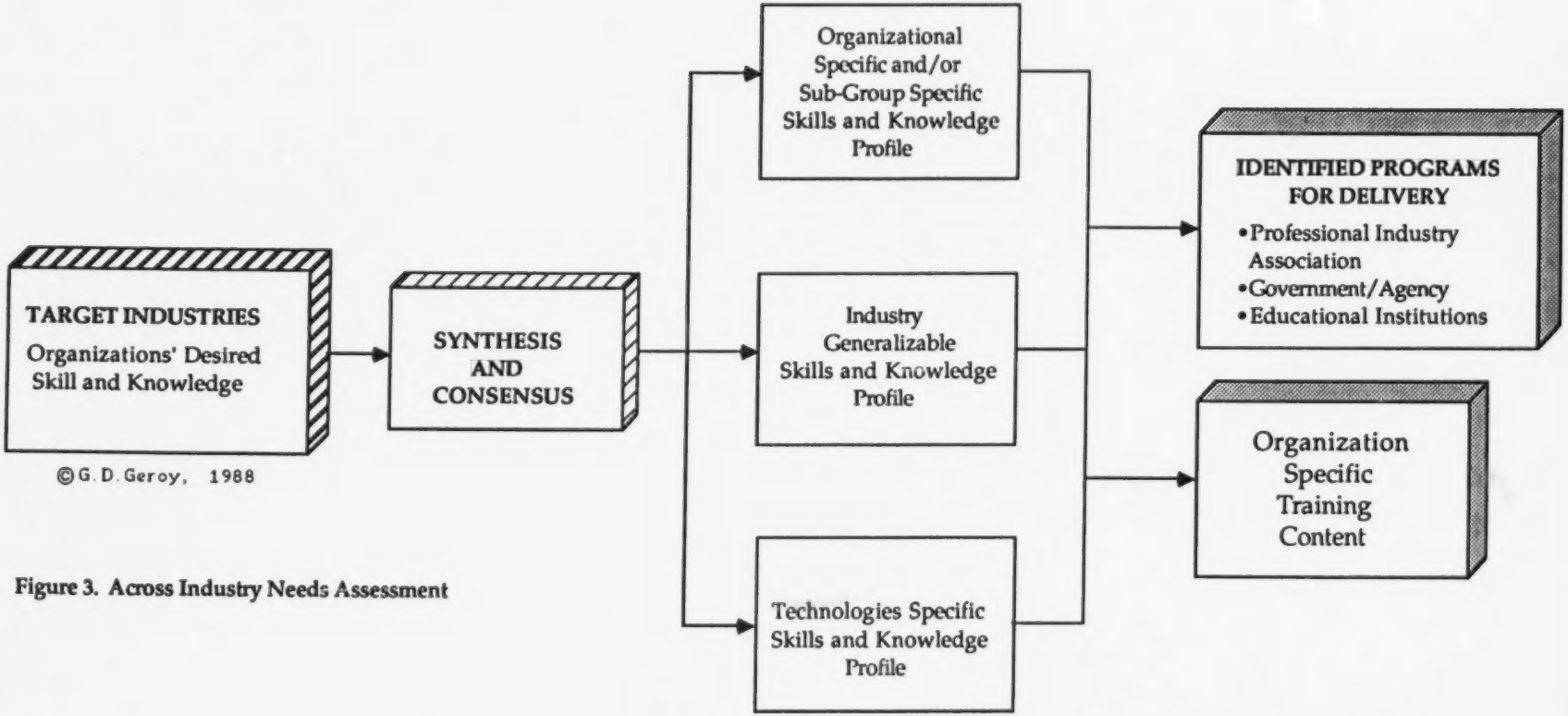

Figure 3. Across Industry Needs Assessment

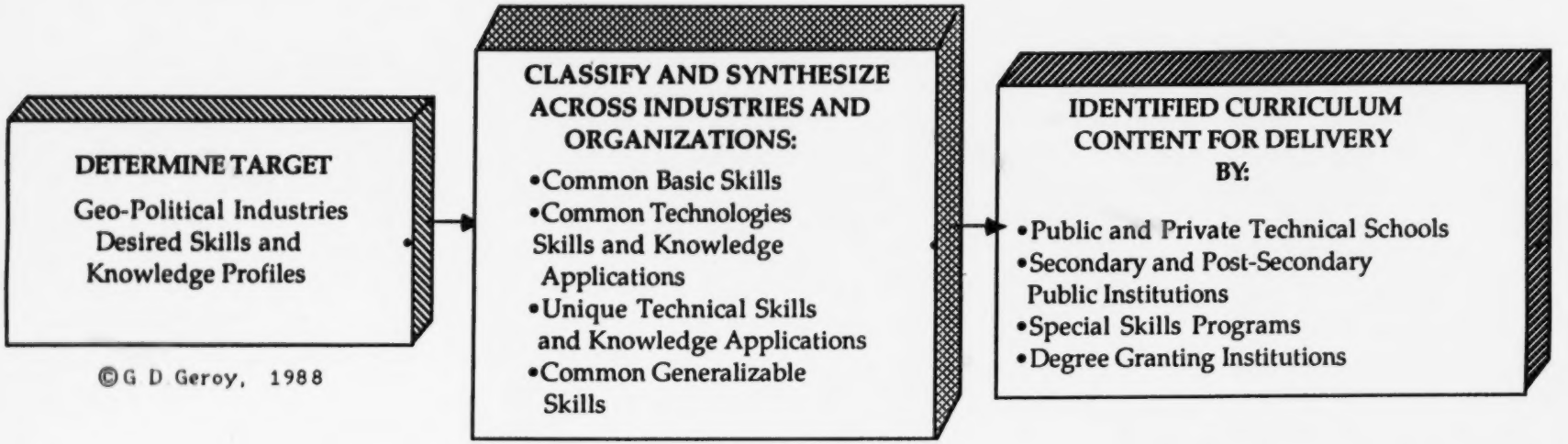

Figure 4. Multi Industry Needs Assessment

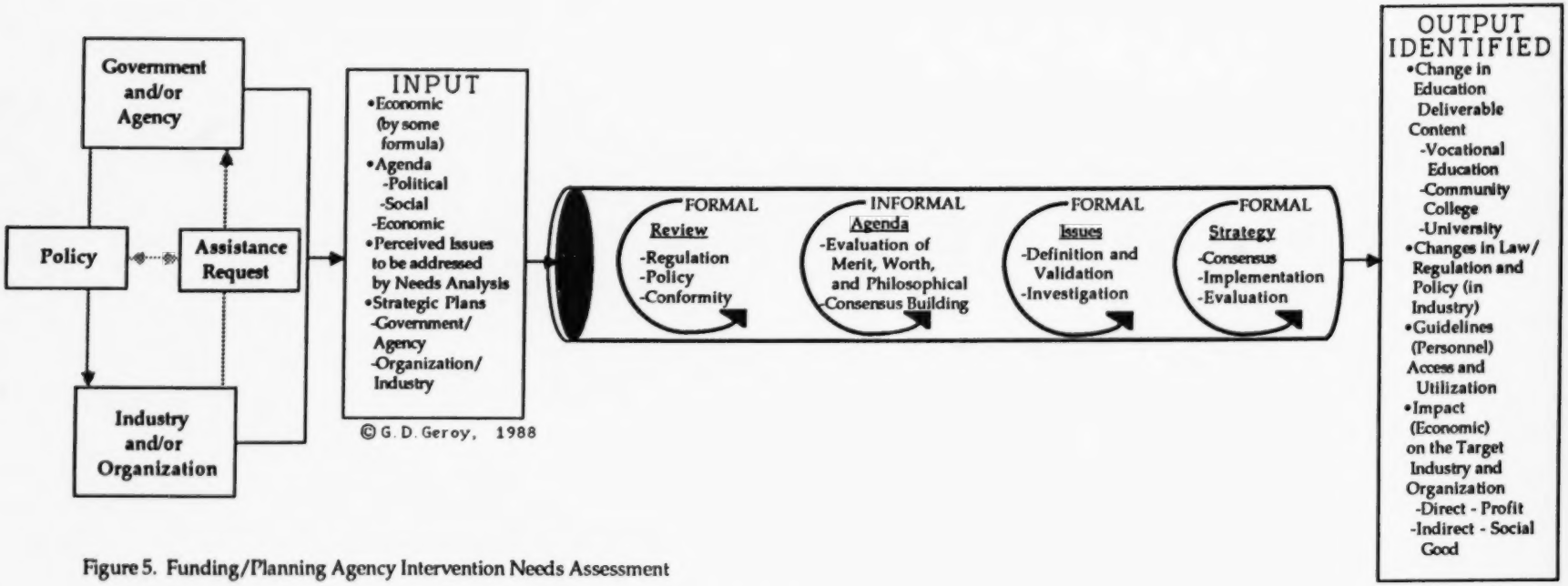

Figure 5. Funding/Planning Agency Intervention Needs Assessment

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